(508) there are a requantizing block (506) and a DCT filtering block (507) in any order, of which said variable length decoder (505), said variable length re-encoder (508) and said requantizing block (506) each comprise a control output,

-between the third data output of said bitstream analyzer (502) and the third data input of said multiplexer (503) an element-wise matrix multiplier block (509) having a control input which is coupled to the control output of said requantizing block (506), and

B7

-between the fourth data output of said bitstream analyzer (502) and the fourth data input of said multiplexer (503) a virtual buffer verifier value modifier block (510) having first and second control inputs of which the first control input is coupled to the control output of said variable length decoder (505) and the second control input is coupled to the control output of said variable length re-encoder (508).

REMARKS

The non-final Office Action dated November 10, 2003 has been received and its contents carefully studied. Reconsideration of the rejections of the claims is respectfully requested in view of the foregoing amendments and the following remarks. Claims 1-21 are pending. All of the other claims stand rejected. The independent claims are claims 1 and 13, which have been rejected as being anticipated under 35 U.S.C. 102(e) by *Yasue et al.* (EP 0944261A2), and also by *Takahashi et al.* (EP 0687112A2).

Let us recall that an MPEG video stream, which is the primary field of the invention, comprises three kinds of pictures: I-pictures, P-pictures and B-pictures. Of these, an encoded I-picture can be decoded without reference to other pictures. An encoded P-picture needs a reference to a previous I- or P-picture for decoding to succeed. An encoded B-picture needs a reference to a previous and/or later I- or P-picture for decoding to succeed.

Regarding *Yasue*, the Office Action refers to the data quantity reduction unit **903** and VLD unit **1002**. In paragraph 131 (column 24, lines 1-7), *Yasue* explains how

the data that will enter these processing blocks only contains I-pictures ("Since P and B picture data are unsuitable to be used as data for rapid play as described above, these data are not used..."). In other words, even if *Yasue* suggests using processing means for reducing the quantity of data, he only suggests aiming such measures at I-pictures and discards the P- and B-pictures altogether. Quite to the contrary, the present claimed invention processes all pictures and realizes the data reduction without losing any of the original frames.

Fig 8

The practical effect of this difference is very significant. If only I-pictures are used for eventual video reproduction (which is the obvious result of taking the *Yasue* approach), the replayed video is twitchy, because a large number of intermediate frames are missing, and a very uneven impression results. If additionally some of the original image data is removed by somehow reducing the volume of data used to carry the I-pictures, the quality of even the independent picture frames inevitably deteriorates. It is clear that what is left of the original video presentation only suffices for something like the rapid play example of *Yasue*, which would be somewhat twitchy in any case, and only needs to give a very rough impression of what the original presentation would look like.

The "reduced" video signal of the present application is still usable after transmission over a connection with limited bandwidth and/or storage in limited capacity storage means. Therefore, the present claimed invention does not accept discarding any of the original picture frames. The present approach is based on slight reductions from every picture frame. This is accomplished by partly decoding the full bit stream and not only some segregated part of it, and by processing the partly decoded full bit stream in a specific way.

The Office Action has referred to FIG. 10 in *Yasue*, which shows how the actual step of data reduction is accomplished in the corresponding functional block **903**. The incoming signal (which only includes the I-pictures) is subjected to variable length decoding in block **1002**, inverse quantization in block **1003** and inverse discrete cosine transformation in block **1004**. The result is a stream of completely decoded I-pictures,

(i.e. a pure video signal); *see* paragraph **110** where the corresponding description is given for data reduction in the fourth embodiment, and the words "digital video signal" explicitly appear. Block **1005** filters high-frequency components out of the completely decoded I-pictures, i.e. from the digital video signal.

The difference between *Yasue* and the present claimed invention can be crystalized in the following way: *Yasue* needs to completely decode a part of the video stream in order to perform data reduction, whereas the present claimed invention partly decodes the complete video stream in order to perform data reduction.

Note that there is a filtering block in the applicant's solution (block **507** in FIG. 5), but it is not used to filter a digital video signal like in *Yasue's* approach. It is instead used to filter the requantized DCT coefficients.

¤Turning now to the rejections based on *Takahashi*, we must first note that the primary embodiments in *Takahashi* (the first and second embodiments) again suggest data reduction to be achieved at the level of the actual video image information, which resembles very much *Yasue's* suggested filtering of the digital video signal. *Takahashi* has probably been so fixed with this idea of handling the whole information that he has never come across the idea of using a bitstream analyser to separate the different kinds of data from each other. In the applicant's invention there is a bitstream analyser (block **502** in FIG. 5) that separates the original video stream into as many as four different component streams, which are the untouched data component stream, the DCT coefficients component stream, the weighing matrices component stream and the VBV component stream. Performing the compression-based operations in separate processing branches for these separate types for data is much more economical than driving the whole encoded video stream through a single processing block where some corners of it are sliced, which efficiently is *Takahashi's* approach.

As the Office Action notes, *Takahashi* does not disclose using a bitstream analyser. The Office Action has cited *Yamakage* to show anticipation for this feature, but the applicant must respectfully state that firstly *Yamakage* is not related with reducing the volume or rate of encoded video bitstreams and second no such thing as a

3.0 bitstream analyser can be found in any of *Yamakage's* FIGS. 5-10. In FIGS. 5-7, for example, the connection from the signal input to the coefficient VLC decoding block at the bottom of each drawing is direct, without going through anything that could be called a bitstream analyser.

In the present amended claims, certain features are inserted that correspond to what is stated above with respect to the differences between the present invention and the cited prior art. These features are fully supported by the application as originally filed, and therefore introduce no new matter. Applicant respectfully submits that these additional features are neither taught nor suggested by any of the cited references, or by any combination thereof.

CONCLUSION

Applicants respectfully submit that the amended claims of the present application define patentable subject matter and are patentably distinguishable over the cited references for the reasons explained. The rejections of the Official Action of November 10, 2003 having been shown to be inapplicable, retraction thereof is requested, and early passage of all the pending claims to issue is earnestly solicited.

Applicant would appreciate if the Examiner would please contact Applicant's attorney by telephone, if that might help to speedily dispose of any unresolved issues pertaining to the present application.

Respectfully submitted,

Dated: 3/10/04

Andrew T. Hyman
Attorney for Applicant
Registration No. 45,858

WARE, FRESSOLA, VAN DER
SLUYS & ADOLPHSON LLP
Building Five, Bradford Green
755 Main Street, P.O. Box 224
Monroe, CT 06468
Telephone: (203) 261-1234
Facsimile: (203) 261-5676
USPTO Customer No. 004955